DOCUMENT RESUME

ED 480 362 CE 085 346

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TITLE	The 1996 High Schools That Work Assessment: Good News and Bad News for Health Occupations Programs. Research Brief.
INSTITUTION	Southern Regional Education Board, Atlanta, GA.
REPORT NO	No-5
PUB DATE	1997-06-00
NOTE	10p.; For related Briefs, see CE 085 342-350.
AVAILABLE FROM	For full text: http://www.sreb.org/programs/hstw/publications/briefs/97brief5.asp.
PUB TYPE	Guides - Non-Classroom (055) -- Information Analyses (070)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Academic Achievement; *Allied Health Occupations Education; Comparative Analysis; Educational Policy; Educational Trends; *High School Students; High Schools; *Instructional Improvement; Longitudinal Studies; Mathematics Achievement; National Surveys; *Outcomes of Education; Policy Formation; Racial Differences; Reading Achievement; Science Achievement; Sex Differences; *Student Evaluation; *Vocational Education; Womens Education
IDENTIFIERS	African Americans; *High Schools That Work; Work Based Learning

ABSTRACT

The academic achievement of students in health occupations programs at High Schools That Work (HSTW) sites in 1996 was compared to academic performance levels at HSTW sites in 1994. Health occupations students at HSTW sites improved their average reading scores from 269 in 1993 to 278 in 1996. During the study period, the gap widened between HSTW students in health occupations programs and vocational students nationally. The average reading, mathematics, and science scores of students at the HSTW sites were all higher than those of vocational students in the national sample. Male students in health occupations programs had higher reading, mathematics, and science scores in 1996 than in 1994. The bad news is that smaller percentages of students in health occupations programs met the HSTW performance goals in mathematics and science than did all students participating in the 1996 assessment which is of particular concern given the place of mathematics and science in health care. The following were among the recommendations for further improving health occupations students' performance: (1) set high expectations and get students to meet them; (2) offer intellectually challenging health occupations studies; (3) increase access to classes that teach high-level content; (4) provide a structure of work-based and school based learning; (5) enable academic and vocational teachers to plan together; and (6) involve students and parents in planning programs of study. (MN)

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Research Brief
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HIGH SCHOOLS THAT WORK

Research Brief

Number 5 - June 1997

The 1996 *High Schools That Work* Assessment: Good News and Bad News for Health Occupations Programs

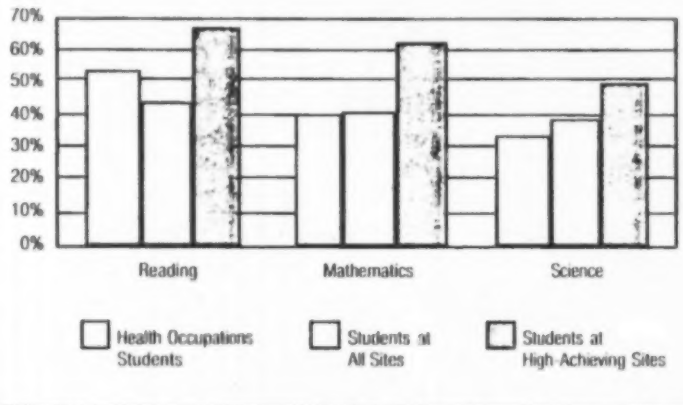
By Gene Bottoms and Alice Presson

The 1996 *High Schools That Work* assessment report contains good news and bad news about the performance of students in health occupations programs. The report shows that student achievement is improving at schools where health occupations teachers join with academic teachers to implement the *HSTW* key practices. The good news is apparent in three ways:

1. *HSTW* sites that participated in the assessment in 1994 and again in 1996 showed significant improvement in average reading scores for health occupations students. The scores increased from 269 to 278. A higher percentage of students in health occupations programs met the *HSTW* performance goal in reading than did all students participating in the 1996 assessment. (See Figure 1.)
2. *HSTW* sites widened the gap between their students in health occupations programs and vocational students nationally between 1994 and 1996. In 1994 health occupations students at *HSTW* sites had an average reading score of 269, compared to 267 for vocational students in the national sample. They had a mathematics score of 278, compared to 277 for vocational students nationally, and a science score of 279, compared to 267 for vocational students in the national sample. Students at *HSTW* sites continued to outpace the national group in reading, mathematics and science in 1996. (See Figure 2.)
3. Male students in health occupations programs had higher reading, mathematics and science scores in 1996 than in 1994.

Figure 1

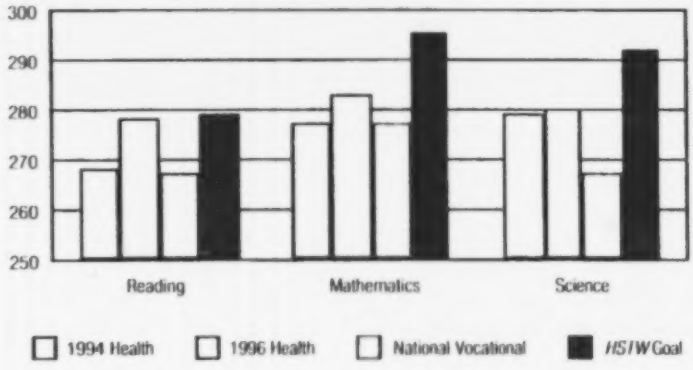
Percentage of Health Occupations Students Meeting *HSTW* Performance Goals



The bad news is that smaller percentages of students in health occupations programs met the *HSTW* performance goals in mathematics and science than did all students participating in the 1996 assessment. (See Figure 1.) Furthermore, their average mathematics and science scores were statistically lower than the average scores for all youth participating in the assessment. **This news must be a concern for teachers in a field in which accurate use of mathematics and science skills by employ-**

Figure 2

Health Occupations Students' Performance



ees in hospitals or other health care settings can mean the difference between life and death. Also, the mathematics and science achievement of African American youth and females in health occupations programs did not improve between 1994 and 1996.

Health occupations teachers must ask themselves if their students, who are predominantly female, are taking the mathematics and science courses that require them to do challenging assignments that boost achievement, such as solving complicated problems. Or are their students taking courses in which they get good grades by mainly memorizing facts and procedures, without really having to understand or use them?

There is hope in knowing what to do to correct the situation. By reviewing their school's assessment report, health occupations teachers can look at what high-achieving schools are doing to get more youth to meet the *HSTW* goals.

There are more minority students at high-achieving sites than among all health occupations students at all *HSTW* sites—42 percent at high-achieving sites, compared to 32 percent at all *HSTW* sites.

Health occupations students at high-achieving schools substantially exceeded the *HSTW* goals in reading, mathematics and science. They had a reading score of 291, compared to 278 for health occupations students at all sites; a mathematics score of 298, compared to 283 at all sites; and a science score of 287, compared to 281 at all sites.

Successful health occupations programs can:

- **Set high expectations and get students to meet them.**

HSTW sites that got health occupations students to complete challenging assignments both in and out of class had significantly higher reading, mathematics and science scores. Reading achievement was significantly higher if students did at least one hour of homework daily. Achievement also rose if students were encouraged to take more mathematics and science courses, including at least one of these courses in the 12th grade.

The bad news is that at least one-third of health occupations students are enrolled in watered-down academic courses that they can pass without making any effort outside of class. Twenty-eight percent of health occupations students who scored below the basic level in mathematics and science said they usually had no homework or did not do it. Further, at least 40 percent of health occupations students had no weekly homework assignments from a vocational teacher. Teachers need to get students to work harder in academic and health occupations classes.

Figure 3

Vocational Teachers Stressed:

	Reading	Mathematics	Science
	Average Scores		
Never	266	275	269
Often	281	282	285

Figure 4

Performance of Health Occupations Students Completing Challenging Academic Courses

Curriculum Level	Percent	Average Score	*HSTW* Goal
High-Level English	39	285	279
Low-Level English	61	274	
High-Level Mathematics	71	290	295
Low-Level Mathematics	29	265	
High-Level Science	56	286	292
Low-Level Science	44	274	

■ **Offer intellectually challenging health occupations studies.**

The good news is that health occupations students who said their vocational teachers often stressed reading, mathematics and science in getting them to complete challenging assignments had higher achievement than students who said their vocational teachers never stressed those academic skills. (See Figure 3.)

The bad news is that one-third of health occupations students who participated in the assessment at *HSTW* sites in 1996 were enrolled in health occupations courses that lacked challenging assignments and projects. Thirty-seven percent of these students were rarely required to apply mathematics to complete assignments; 20 percent rarely had to seek technical information and organize it into a procedure for completing a project; 36 percent rarely had to use scientific principles to explain particular systems; 47 percent seldom or never had to use a computer to complete a vocational assignment; and 51 percent never or seldom had to write critiques of their work or make oral reports. Between 1994 and 1996, there was no significant increase in the percentage of health occupations students who said they had these experiences. Approximately half of these students are still enrolled in courses that are not preparing them for an information-centered workplace in the health field. Health occupations teachers need to decide if they are going to change or continue to provide courses taught in ways that deny youth access to successful further study and to higher paying jobs that require learning and thinking skills.

■ **Increase access to classes that teach high-level content.**

The good news is that between 1994 and 1996 increasing proportions of health occupations students completed higher-level mathematics and science courses. Students who take rigorous academic courses have significantly higher reading, mathematics and science achievement than students who take lower-level courses. For example, health occupations students who completed the *HSTW*-recommended curriculum of high-level English, mathematics and science courses had higher average scores than students who took lower-level courses. (See Figure 4.)

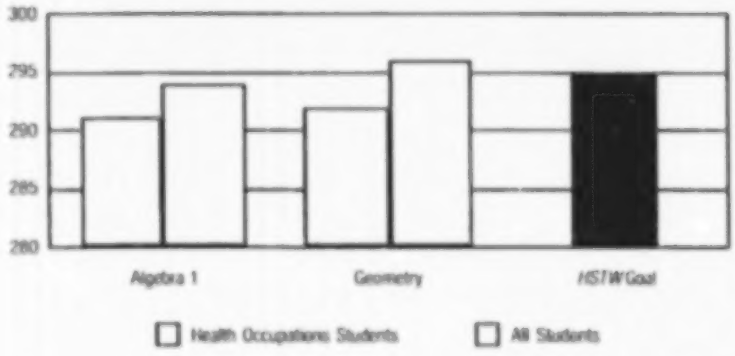
The bad news is that health occupations students taking high-level mathematics and science classes have average achievement that fails to meet *HSTW* goals, in comparison to students from other occupational areas who take these courses and meet the *HSTW* mathematics and science goals. (See Figures 5 and 6.) The challenge is two-fold:

- Health occupations teachers need to take the initiative in working with mathematics and science teachers to develop joint health-based projects that cause students to apply mathematics and science content to complete them.
- Mathematics and science teachers need to teach in ways that motivate health occupations students to work hard to meet higher standards.

■ **Have students complete a challenging program of study consisting of an upgraded academic core and a major. An upgraded core includes at least four years of college preparatory English and three years each of mathematics and science, including at least two years in each area equivalent in content to courses offered in the college preparatory curriculum. A major includes at least four Carnegie units in a broad technical field or further academic studies and two Carnegie units in related technical or academic core courses.**

Figure 5

Achievement of Health Occupations Students by Mathematics Courses Taken



The good news is that health occupations students who complete all components of the *HSTW*-recommended curriculum greatly exceed the *HSTW* goals in reading, mathematics and science. Students completing the recommended curriculum scored 28 points higher in reading, 44 points higher in mathematics and 29 points higher in science on the 1996 assessment than did students who completed a less demanding program of study. Students completing the recommended curriculum have average reading, mathematics and science scores that begin to approximate those of college-prep students nationally.

The bad news is that 74 percent of health occupations students at all *HSTW* sites did not complete an upgraded academic core with a health occupations concentration. However, 71 percent of health occupations students at all sites completed the recommended curriculum in mathematics. This is evidence that the problem is with the "system" rather than the student.

Teachers must educate their prospective students and their parents about the type of academic courses needed to succeed in further education and the health field. Health occupations teachers must recognize that the success of their graduates is dependent on taking rigorous mathematics, science and language arts courses and quality health occupations courses.

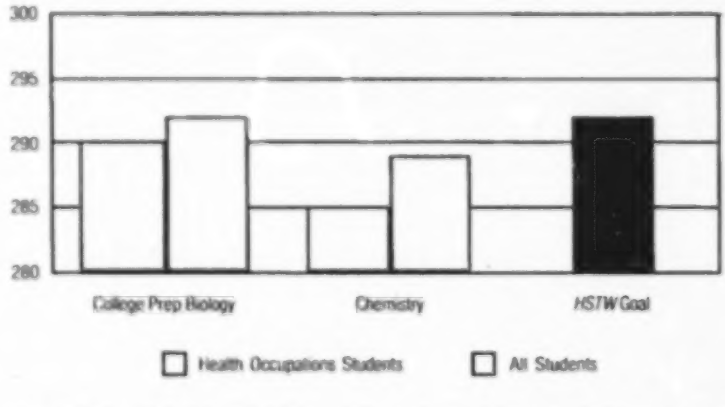
■ **Provide a structure of work-based and school-based learning.**

The good news is that health career students who work up to 15 hours a week have higher reading, mathematics and science scores than students who do not work at all or work more than 15 hours weekly. More health occupations students than other vocational students earn school credit through work-site learning—42 percent, compared to 34 percent for all vocational students. A higher percentage of health occupations students than students in other vocational fields are having the high-quality work-site learning experiences associated with higher achievement. For example:

- 30 percent of health occupations students rotated through several departments, compared to 23 percent of all students;
- 55 percent said someone taught them to do the work, compared to 47 percent of all students;
- 54 percent said their job performance was evaluated by clear

Figure 6

Achievement of Health Occupations Students by Science Courses Taken



standards, compared to 43 percent of all students;

- 60 percent said they were encouraged to develop good work habits, compared to 53 percent of all students;
- 61 percent said work experiences encouraged them to develop good customer relations, compared to 52 percent of all students;
- 35 percent said their employer encouraged them in their academic studies, compared to 30 percent of all students.

The same percentage of both groups—29 percent—observed veteran workers, but health occupations students had higher average scores in reading.

The bad news is that health occupations students who receive school credit for work-based learning have lower reading, mathematics and science achievement than students who receive no credit. Two factors contribute to lower achievement: 1) Students who receive credit are more likely to work 21 hours or more per week and 2) They are much less likely to take mathematics or science courses in the 12th grade.

The hope lies in the fact that health occupations teachers can set high standards for awarding school credit for work-site learning. In doing so, they should:

- Award work-site credit only to students who are completing the *HSTW*-recommended curriculum;
- Require students to take four school-based credits as seniors, including three credits in high-level academic courses.

■ Enable academic and vocational teachers to plan together.

The good news is that the achievement of health occupations students at the 15 *HSTW* sites participating in an advanced integrated learning effort—giving academic and vocational teams time to do collaborative planning—was higher than that of such students at other sites. Health occupations students at advanced sites exceeded the *HSTW* goal in reading and nearly met the goals in mathematics and science, in comparison to health occupations students at all sites, who scored slightly below the *HSTW* reading goal and considerably below the goals in mathematics and science.

The bad news is that there is little evidence that more health occupations and academic teachers were working together in 1996 than in 1994 to get students to complete joint learning assignments. Health occupations teachers need to take the lead in joining with English, mathematics and science teachers to get an organizational schedule that enables them to plan and carry out joint instructional efforts that motivate students to do more demanding assignments.

■ Actively engage students in learning.

The good news is that health occupations students learn more when they are engaged in doing challenging assignments. Activities associated with higher achievement include collecting, evaluating, organizing and presenting information for senior projects, major research papers, short reflective writing assignments and special mathematics projects. Other activities include solving open-ended problems and completing projects that require academic and technical knowledge.

The bad news is that many health occupations students do not remember having to complete intellectually-challenging assignments.

- 71 percent never made a presentation in class about a special mathematics project;
- 61 percent never used a computer to complete a mathematics assignment;
- 50 percent seldom presented oral reports in their vocational classes.

Health occupations teachers can take the lead in involving academic teachers in using national standards to plan challenging health-related projects that cause students to use high-level academic, technical and problem-solving skills.

■ Involve students and parents in planning a program of study.

The good news is that the percentage of *HSTW* health occupations students planning to pursue further study increased from 70 percent in 1994 to 77 percent in 1996.

The bad news is that at least half of the health occupations students planning to continue their education were not prepared to do so. The quality of guidance services provided to these students did not improve very much between 1994 and 1996. Twenty-six percent of health occupations students at *HSTW* sites in 1996 reported that they received no help in planning a program of study or that they simply did not have a plan. Only 22 percent of youth said they met with

their parents and a counselor or advisor to plan a program of study. Health occupations teachers can take the lead in giving prospective health occupations students, their parents and their academic teachers a "reality check" on the strengths and weaknesses of students' preparation for further learning in a postsecondary or work setting. These "reality checks" can include postsecondary placement exams, employment tests, job-shadowing experiences and internships.

■ Provide extra help.

The good news is that more than half of health occupations students at *HSTW* sites reported receiving extra help in reading from their English teachers. Almost 82 percent reported receiving extra help from their mathematics teachers.

The bad news is that only 19 percent got help from a mathematics tutor and only 14 percent received extra help in reading from a special resource teacher. More health occupations students may need help in specific mathematics concepts and skills.

■ Use Student Assessment to Advance Student Learning.

The good news is that *HSTW* sites make improvement when they use data on student achievement and on school and instructional practices to change what is taught and what is expected. Schools make progress in advancing student learning when leaders and teachers work together to find and implement solutions to problems identified by the data.

The bad news is that too many health occupations teachers are failing to use data to engage other faculty and health-related business leaders in efforts to better prepare students for further learning in health career fields. Health occupations teachers need to obtain the 1996 *HSTW* Assessment data from their *HSTW* site coordinator and use it.

■ Summary

The most successful health occupations programs engage other teachers, parents and health-related business leaders in sending the message that high performance in academic and health occupations classes is essential for entering and advancing in the health field.

What Can Health Occupations Teachers Do?

Health occupations teachers can take hope from the experiences of *HSTW* sites that improved between 1994 and 1996. To help improve the reading, mathematics and science achievement of their students, they can:

- Require students to complete an upgraded academic core and a health occupations major that meet the *HSTW*-recommended curriculum standards;
- Help eighth-, ninth- and 10th-graders interested in health careers to understand the importance of taking the right English, mathematics and science classes— Algebra II, Geometry, College-Prep Physical Science, College-Prep Biology, Lab Chemistry and College-Prep English.
- Require students individually and in groups to frequently use academic skills in reading, writing, mathematics and science in completing challenging health occupations-related projects. Require students to:
  1. Do research and synthesize findings in a written report.
  2. Use mathematics and science principles to complete research projects.
  3. Make classroom presentations about what they learned through their research projects.
  4. Use a computer to complete research projects.
  5. Demonstrate independent learning skills.
  6. Pass tough knowledge-based exams and demonstrate understanding of both academic and technical content.
- Use national health and academic standards to design curriculum and to plan challenging health occupations-based projects.
- Use health occupations work sites to advance school-based academic and technical studies by involving English, mathematics and science teachers in a planning process that enables them to connect their content to work site experiences.
- Make academic teachers members of the health occupations advisory committee.

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